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KNOBBE MARTENS OLSON & BEAR LLP 2040 MAIN STREET FOURTEENTH FLOOR IRVINE, CA 92614			ZHENG, LOIS L	
			ART UNIT	PAPER NUMBER
			1742	

DATE MAILED: 04/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/960,236

Applicant(s)

BASOL ET AL.

Examiner

Lois Zheng

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 18 January 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-50 is/are pending in the application.
- 4a) Of the above claim(s) 34 and 35 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-33 and 36-50 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 March 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 12 November 2002.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Status of Claims***

1. Applicant's election without traverse of claims 1-33 and 36-50 in the reply filed on 18 January 2005 is acknowledged.

Claims 34-35 are withdrawn in view of the amendment.

Therefore, claims 1-33 and 36-50 are currently under examination.

### ***Drawings***

2. The drawings are objected to under 37 CFR 1.83(a) because they fail to show
  - i. Fig. 15 as described on page 2 line 26 of the specification,
  - ii. Center point, numeral 48, as described on page 7 lines 17 and 20 of the specification, and
  - iii. Channels 302(a), 302(b), and channel system 402, as described on page 15 of the specification.

Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief

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description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

3. In Fig. 14, numeral 50 should be changed to 500.

#### ***Specification***

4. Appropriate corrections are required for typographical errors. For example, on page 11, line 25, "mask late" should be changed to "mask plate".

#### ***Claims***

5. In claim 43, line 2, "parallel chambers" should be "parallel channels".

#### ***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 1-3, 7, 9, 13-14, 23-24, 27-28 and 31-32 are rejected under 35 U.S.C. 102(e) as being anticipated by Uzoh et al. US 6,413,388 B1(Uzoh'388).

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Uzoh teaches design and structures for a plating and polishing pad used in an electroplating/electroetching apparatus(abstract).

With respect to claim 1 of the instant invention, Uzoh'388 teaches, in Fig 6f, the claimed pad having the claimed top and bottom surfaces, claimed channels (i.e. known as grooves in Uzoh'388, numeral 662), and claimed holes within the channels(i.e. known as channels in Uzoh'388, numeral 664). Uzoh'388 also teaches a substrate holder that can move the substrate up and down, and along x, y and z axis(col. 4 lines 49-51). Uzoh'388 further teaches that the substrate holder can push the substrate against the pad(col. 4 lines 51-52). Therefore, Uzoh'388 meets the claim limitation of the relative movement and physical contact between the pad and substrate. The channels(numeral 664) of Uzoh'388 extend across the pad, therefore, inherently capable of allowing the electrolyte solution to flow therethrough and out of the channel as claimed.

With respect to claim 24 of the instant invention, the instant claim is rejected for the same reason as stated in the rejection for instant claim 1 above. In addition, since the apparatus of Uzoh'388 is used for electroplating/electropolishing, the claimed electrical potential receiving terminal and the claimed at least one electrical contact would have been inherently present in order for the electroplating/ electropolishing apparatus to be operational. Furthermore, since Uzoh'388's channels(i.e grooves 662 in Fig 6f) are equally spaces and parallel to each other, and the holes appear to have the same size, Uzoh'388's channels inherently meets the claim limitations of allowing "a

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substantially equal amount of processing to occur on a center region of the workpiece and the edge region of the work piece" as recited in instant claim 24.

With respect to claims 2 and 3 of the instant invention, the examiner is interpreting the claimed "center point of the pad" as an area in the center of the pad. Therefore, the horizontal and vertical channels going through the center area of the pad meets the claim limitation of "disposed radially from the center portion of the pad to an edge portion of the pad" as recited in instant claim 2. Furthermore, Fig 6f of Uzoh'388 shows more than one hole (numeral 664) between the top and bottom surfaces of the pad, which meets the claim limitations of the instant claim 3.

With respect to claims 7, 13, 27 and 31-32 of the instant invention, the instant claims are rejected for the same reason as stated in the rejection for claim 1 above.

With respect to claim 9 of the instant invention, the instant claim is rejected for the same reason as stated in the rejection for claim 3 above.

With respect to claims 14 and 28 of the instant invention, Uzoh'388's pad has channels that are parallel to each other as claimed.

With respect to claim 23 of the instant invention, Uzoh'388 further teaches that the pad material may contain abrasives (col. 8 lines 35-37).

8. Claim 25 is rejected under 35 U.S.C. 102(e) as being anticipated by Uzoh'388 as evidenced by US co-pending application 09/472,523, now US 6,612,915, disclosed by Uzoh'388.

The teachings of Uzoh'388 are discussed in paragraph 7 above.

Uzoh'388 further admits that US co-pending application 09/472,523, now US 6,612,915 teaches the use of electrical contact ring comprising a plurality of contact members (Fig. 6a).

Therefore, Uzoh'388 also teaches the claimed more than two electrical contacts(i.e. plurality of contact members on the contact ring) to establish electrical contact with the substrate as recited in the instant claim.

9. Claims 1-3, 7, 9, 13-15, 21-24, 27-28 and 31-32 are rejected under 35 U.S.C. 102(e) as being anticipated by Emesh et al. US 2002/0108861 A1(Emesh).

Emesh teaches an electrochemical planerization apparatus comprising a polishing pad(abstract).

With respect to claim 1 of the instant invention, Emesh teaches, in Fig. 9, the claimed pad(Fig. 4 numeral 40) for polishing having the claimed top and bottom surfaces, claimed channels (i.e. known as grooves in Emesh, Fig. 9 numeral 120), and claimed holes within the channels(i.e. known as apertures in Emesh, numeral 210). Emesh also teaches that the polishing pad can move in a rotational, orbital or linear pattern(page 5, paragraph 55). Emesh further teaches that the wafer carrier pushes the wafer against the polishing pad(page 54 paragraph 54). Therefore, Emesh meets the claim limitation of the relative movement and physical contact between the pad and substrate. The channels(Fig. 9 numeral 120) of Emesh extend across the pad, therefore, inherently capable of allowing the electrolyte solution to flow therethrough and out of the channel as claimed.

With respect to claim 24 of the instant invention, the instant claim is rejected for the same reason as stated in the rejection for instant claim 1 above. In addition, since the apparatus of Emesh is used for electropolishing, the claimed electrical potential receiving terminal and the claimed at least one electrical contact would have been inherently present in order for the electropolishing apparatus to be operational. Furthermore, since Emesh's channels(i.e grooves 120 in Fig 9) are equally spaces and parallel to each other, and the holes appear to have the same size, Emesh's channels inherently meets the claim limitations of allowing "a substantially equal amount of processing to occur on a center region of the workpiece and the edge region of the work piece" as recited in instant claim 24.

With respect to claims 2 and 3 of the instant invention, the examiner is interpreting the claimed "center point of the pad" as an area in the center of the pad. Therefore, the horizontal and vertical channels going through the center area of the pad meets the claim limitation of "disposed radially from the center portion of the pad to an edge portion of the pad" as recited in instant claim 2. Furthermore, Fig 9 of Emesh shows more than one hole(numeral 210) between the top and bottom surfaces of the pad, which meets the claim limitations of the instant claim 3.

With respect to claims 7, 13, 27 and 31-32 of the instant invention, the instant claims are rejected for the same reason as stated in the rejection for claim 1 above.

With respect to claim 9 of the instant invention, the instant claim is rejected for the same reason as stated in the rejection for claim 3 above.



With respect to claims 15 and 21 of the instant invention, Emesh further teaches the claimed slit(i.e. known as windows in Emesh, Fig. 9 numeral 220). The slits in the horizontal and vertical channels that are located in the center area of the pad have two opposite sides parallel to the edges of the channel.

With respect to claims 14 and 28 of the instant invention, Emesh's polishing pad has channels that are parallel to each other as claimed.

With respect to claim 23 of the instant invention, Emesh further teaches that the pad material may be formed of abrasive material(page 4, paragraph 44).

With respect to claim 22 of the instant invention, Fig. 9 of Emesh shows that all of the channels contain slits as claimed.

***Claim Rejections - 35 USC § 103***

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 4-5, 10-12, 17, 19, 36-40, 42 and 48-49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Emesh in view of Uzoh et al. US 6,261,426 B1(Uzoh'426).

The teachings of Emesh are discussed in paragraph 8 above.

However, Emesh does not specifically teach the claimed plurality of holes dimensioned to provide greater flow at the edge portion of the pad than in the central portion of the pad as claimed.

Uzoh'426 teaches an electrodeposition or electroetching system comprising a baffle between the inlet flow and the substrate(Fig. 1 numeral 8). Uzoh'426 further teaches that the baffle includes larger openings at the center of the baffle and smaller openings at the edge of the baffle(Fig. 2-5).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have incorporated the various size openings of Uzoh'426 into the holes of the polishing pad channels of Emesh in order to improve the uniformity of the deposited or the etched coating layer as taught by Uzoh'426.

With respect to claims 4-5 and 10-11 of the instant invention, even though Emesh in view of Uzoh'426 only teaches the larger openings at the center portion of the pad and smaller openings at the edge of the baffle in order to direct more current flow toward the center of the substrate, one of ordinary skill in the art would have found the claimed larger size holes in edge portion of the pad and smaller size holes at the center portion of the pad obvious since larger size holes obvious since Uzoh'426 teaches the size of openings can be varied to better control the fluid flow and distribution.

With respect to claim 12 of the instant invention, Emesh further teaches the claimed slit(i.e. known as windows in Emesh, Fig. 9 numeral 220). The slits in the horizontal and vertical channels that are located in the center area of the pad have two opposite sides parallel to the edges of the channel. Since Emesh does not explicitly disclose the width of the slits, based on the broadest interpretation, the examiner concludes that the slits of Emesh are narrow enough to read on the claim limitation of

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"other opposite sides having a shape corresponding to a radius from a corresponding center portion of the pad" as recited in instant claim 12.

With respect to claim 17 of the instant invention, the larger size channel holes in the center portion of the pad of Emesh in view of Uzoh'426 are inherently capable of allowing larger amount or processing to occur at the center region of the workpiece than the edge region of the workpiece as claimed.

With respect to claim 19 of the instant invention, the larger size channel holes at the edge portion of the pad of Emesh in view of Uzoh'426 are inherently capable of allowing larger amount or processing to occur at the edge region of the workpiece than the center region of the workpiece as claimed.

With respect to claim 36 of the instant invention, the apparatus of Emesh in view of Uzoh'426 having different hole sizes at the center and edge portions of the pad meets limitations of producing "greater amount of processing to occur on one region of the workpiece than another region of the workpiece". The claim is also rejected for the same reason as stated in the rejection of instant claim 1 above.

With respect to claim 39 of the instant invention, the holes in the pad channels of Emesh in view of Uzoh'426 are inherently capable of allowing the solution to flow through the channels of Emesh in view of Uzoh'426 when the pad is in contact with the workpiece as claimed.

With respect to claims 37-38, 40 and 42 of the instant invention, the apparatus of Emesh in view of Uzoh'426 having different hole size at the center and edge portions of the pad inherently creates claimed center and edge region of the workpiece as claimed.

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With respect to claim 48 of the instant invention, the channels of Emesh in view of Uzoh'426 are parallel to each other as claimed.

With respect to claim 49 of the instant invention, the slits of Emesh in view of Uzoh'426(i.e known as windows) meets the limitation of the claim.

12. Claims 6, 8 and 44 - 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Emesh in view of Uzoh'426, and further in view of Uzoh'388.

The teachings of Emesh and Uzoh'426 are discussed in paragraphs 9 and 11 above.

However, Emesh in view of Uzoh'426 does not explicitly teach the claimed V shaped channels.

The teachings of Uzoh'388 are discussed in paragraphs 6-7 above. Uzoh'388 further teaches V shaped channels in Fig. 6h(i.e. known as V shaped grooves) and the channels with gradually changing width between the center and the edge portions of the pad in Fig. 9g(i.e. also known as V shaped grooves)

With respect to claims 6, 8, 44 and 47 of the instant invention, one of ordinary skill in the art to have incorporated the V shaped channels and channels with gradually changing width of Uzoh'388 into the pad of Emesh in view of Uzoh'426 in order to enhance fluid transfer and agitation between the substrate and anode as taught by Uzoh'388.

With respect to claims 45-46 of the instant invention, due to the changing width in the channels of Emesh in view of Uzoh'426 and Uzoh'388, the center and edge regions

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of Emesh in view of Uzoh'426 and Uzoh'388 read on the claimed center and edge regions.

13. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Emesh in view of Uzoh et al. US 6,612,915(Uzoh'915).

The teachings of Emesh are discussed in paragraph 9 above.

However, Emesh does not explicitly teach the claimed at least two electrical contacts as recited in instant claim 25.

Uzoh'915 teaches a workpiece holder comprising an electrical contact ring with plurality of contact members as shown in Fig. 6a.

Therefore, one of ordinary skill in the art would have incorporated the electrical contact ring with plurality of contact members as taught by Uzoh'915 into the apparatus of Emesh in order to provide uniform current distribution as taught by Uzoh'915.

14. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Emesh in view of Basol et al. US 2002/0134748 A1(Basol).

The teachings of Emesh are discussed in paragraph 9 above.

However, Emesh does not explicitly teach the claimed slit extends part the edge region of the workpiece as recited in the instant claim 16.

Basol teaches an apparatus for electrochemical mechanical processing(abstract) comprising a shaping plate or belt as a workpiece surface influencing device(page 3, paragraph 35, page 6, paragraphs 53-56).

Therefore, it would have been obvious to one of ordinary skill in the art to have utilized the shaping plate or belt(i.e. rectangular shaped mask plate) of Basol into the

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polishing pad of Emesh since the shaping plate or belt can perform the same function as the polishing pad as taught by Basol(page 3, paragraph 35).

With respect to claim 16 of the instant invention, Emesh in view of Basol teaches a rectangular polishing plate or belt with the claimed channels, holes and slits. Since the polishing plate or belt of Emesh in view of Basol is longer than the diameter of the workpiece wafer (Basol, Fig. 11A-B, Fig. 12A-B), the slits of the polishing plate or belt of Emesh in view of Basol inherently extends past the edge portion of the workpiece allowing the electrolyte to flow therethrough and out of the channels when contacting the workpiece as claimed.

15. Claims 26 and 29-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Emesh in view of Uzoh'915, and further in view of Basol.

The teachings of Emesh and Uzoh'915 are discussed in paragraph 13 above.

However, Emesh in view of Uzoh'915 do not explicitly teach the claimed rectangular shaped mask plate as recited in instant claim 26.

The teachings of Basol are discussed in paragraph 14 above.

With respect to claim 26 of the instant invention, it would have been obvious to one of ordinary skill in the art to have utilized the shaping plate or belt(i.e. rectangular shaped mask plate) of Basol into the polishing pad of Emesh in view of Uzoh'915 since the shaping plate or belt can perform the same function as the polishing pad as taught by Basol(page 3, paragraph 35). In addition, since the width of the shaping plate or belt of Emesh in view of Uzoh'915 is smaller than the diameter of the workpiece wafer (Basol, Fig. 11A-B, Fig. 12A-B), the plurality of electrical contact members of the contact

ring of Emesh in view of Uzoh'915 and Basol inherently meet the claim limitation of "at least two electrical contacts disposed on opposite sides of the mask plate".

With respect to claim 29 and 30 of the instant invention, the claims are rejected for the same reason as stated in the rejection of instant claim 16 above.

16. Claim 50 is rejected under 35 U.S.C. 103(a) as being unpatentable over Emesh in view of Uzoh'426, and further in view of Basol.

The teachings of Emesh and Uzoh'426 are discussed in paragraph 11 above.

However, Emesh in view of Uzoh'426 do not explicitly teach the claimed slit extends part the edge region of the workpiece as recited in the instant claim 50.

The teaching of Basol are discussed in paragraph 14 above.

Therefore, it would have been obvious to one of ordinary skill in the art to have utilized the shaping plate or belt(i.e. rectangular shaped mask plate) of Basol into the polishing pad of Emesh in view of Uzoh'426 since the shaping plate or belt can perform the same function as the polishing pad as taught by Basol(page 3, paragraph 35).

With respect to instant claim 50, the claim is rejected for the same reason as stated in the rejection of instant claim 16 above.

#### ***Allowable Subject Matter***

17. Claims 18, 20, 33, 41 and 43 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 102(e) and 103(a), set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

18. The following is a statement of reasons for the indication of allowable subject matter: The prior art of record does not teach or suggest, either alone or in combination

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the claimed parallel channels having a greater width either at the edge or the center portions of the pad.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lois Zheng whose telephone number is (571) 272-1248. The examiner can normally be reached on 8:30am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

LLZ

  
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